42-045-00070

pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

MEMO

To: Heather Henry
Operations Sections
Southeast Regional Office

From: William Schneider RB for WS
Source Testing Section

Date: June 23, 2014

Through: Charles J. Zadakis CJZ
Environmental Program Manager
Division of Source Testing and Monitoring
Bureau of Air Quality

Rick Begley RB
Environmental Group Manager
Source Testing Section
Division of Source Testing and Monitoring

Re: Source Test Review (eFACTS Inspection No. 1998494)
ConocoPhillips Co. (now Monroe Energy LLC) (PFID No. 293037)
Claus Sulfur Recovery Plant or Unit (Source ID 102) with control by
SCOT Tail Gas Treater (C03) and SRU Incinerator (C102)
Northside Fuel Gas System (NSFG)
Southside Fuel Gas System (SSFG)
Trainer Borough, Delaware County
TitleV Operating Permit No. 23-00003

Monroe Energy LLC (formerly ConocoPhillips Co.) operates a sulfur recovery plant, consisting of two Sulfur Recovery Units (SRUs), as part of its refinery facility in Trainer Borough. The SRUs are described in detail in the ACCI 2006 and the WESTON 2011 SRU Emissions test reports. As copied from the review memo of the 2006 testing: "Briefly, two SRUS are used to recover sulfur from an incoming feed stream of SO_2 and H_2S contained in sour water and acid gases from the sour water stripper and amine unit. The Claus SRU processes the incoming feed using two parallel trains, with the Claus tail gases sent to the SCOT SRU to further reduce the H_2S. The process allows for approximately 99.8% of the Sulfur in the incoming feed stream to be recovered, with the recovered Sulfur stored in a common heated pit, prior to be shipped by railcar.

The exhaust emissions from the SCOT unit, along with induced vapors from the pit are sent to the natural-gas fired SRU incinerator, which uses a temp of approximately 1250 °F to oxidize the sulfur compounds, with emissions sent to the atmosphere via an outlet stack on top of the incinerator."

volumetric flow rate meter (per the protocol with conditions letter for this testing, this calibration information was to be included in the test report, but this information was not in the report), (c) a calibrated measurement device for determining the weight fraction of Sulfur in the feed gases and (d) the calculations assume no dry correction is needed for the volumetric flow rate. If the facility's SO_2 ppm value is measured dry, then a dry correction would be needed for the volumetric flow rate, unless all moisture is removed prior to the measurement of the flow. However, if a dry correction was needed and the moisture amount was not large, a dry correction may have not had a large impact on the result.

For future testing at this facility, we will need to indicate to the facility that the documentation for the accuracy of the above variables is in the test report. At this point, it appears that based on the facility information, this source was well within the 0.036 lbs SO_2 in SRU exhaust/lb sulfur in the feed gases allowable on the day of the testing (see detailed process data in the test report and process data summary information on p. 4 of this memo).

2. Per the allowables for the NSFG and SSFG systems:

   Based on my review of the permit, there are no H_2S allowables for these sources. However, various sources in the permits (such as various boilers, heaters, the RFG supply line and flares) have H_2S allowables ranging from 50 ppm to 230 mg/dscm (230 mg/dscm, will be equivalent to a value of approximately 162 to 163 ppm). The facility's CEMS for the NSFG and SSFG systems have been apparently approved for documenting compliance for the individual allowables. The CEMs allowable have been set at 162 ppm, which is the most prevalent allowable listed for the sources in the permits with an H_2S allowable.

The results on the following pages were extracted from the test report:

discussion on this issue in the footnote 3 underneath the previous table.

[2] The facility calculated these allowables by multiplying the permit allowable of 0.036 lbs SO_2 outlet/lbs S in the feed gases by the sulfur production rate.

H_2S concentrations in Northside Fuel Gas System (May 17, 2011)

	Test Run Nos. and Times			
Parameter	1 0917-1017	2 1026-1126	3 1134-1234	Average [1]
mg/dscm Impingers 3-4 Impinger 5 Total [1]	 29.311 1.6 30.911	 30.599 1.2 31.799	 29.240 1.5 30.740	 29.7 1.4 31.2
ppm Impingers 3-4 Impinger 5 Total [1]	 20.802 1.1 21.902	 21.716 0.9 22.616	 20.752 1.1 21.852	 21.1 1.0 22.1

H_2S concentrations in Southside Fuel Gas System (May 18, 2011)

	Test Run Nos. and Times			
Parameter	1 0851-0951	2 1003-1103	3 1113-1213	Average [1]
mg/dscm Impingers 3-4 Impinger 5 Total [1]	 23.847 0.822 24.669	 26.997 0.826 27.823	 26.039 1.370 27.409	 25.6 1.0 26.6
ppm Impingers 3-4 Impinger 5 Total [1]	 16.925 0.584 17.509	 19.160 0.587 19.747	 18.480 0.973 19.453	 18.2 0.7 18.9

[1] The total sums and most of the three-run averages were not in the test report and these values were computed by myself.

Process data (more details in test report):

The test report has detailed process data listing the refinery gas flow rate (MSCFH) for each Northside and Southside producer and consumer recorded during the test. On the next page are listed the overall summary totals per test run. Information for the rated capacities, maximum normal operating conditions and expected rates for the above sources during testing was discussed as part of the protocol. Tables containing the parameters discussed in the previous sentence can be found on pp. 6-8 of the protocol with approval conditions letter for this testing, with a copy of this letter listed in Appendix F at the end of the test report.